

Remarks:

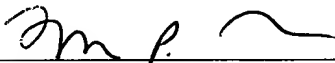
The purpose of the amendment is to present claims in proper U.S. claims idiom and to remove multiple dependencies.

The recommended subheadings have been inserted at the proper locations in the text.

All of the changes are properly supported in the original application. No new matter has been added.

An early action on the merits of the application is solicited.

Respectfully submitted,

  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor : Hans-Jürgen Hacke  
Appl. No. : 09/833,260  
Filed : April 10, 2001  
Title : Electronic Component Having Microscopically  
Small Contact Areas and Method for  
Fabricating It

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P R E L I M I N A R Y A M E N D M E N T

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Translated Specification:

Page 1, lines 3-4, [Electronic device having microscopically  
small contact areas and methods for producing it]

ELECTRONIC DEVICE HAVING MICROSCOPICALLY SMALL CONTACT AREAS

AND METHODS FOR PRODUCING THE ELECTRONIC DEVICE

Page 3, lines 13-16, [This object is achieved by means of the  
features of the subject matter of the independent claims.  
Advantageous developments of the inventions emerge from the  
dependent claims.]

Page 30, line 19 through page 31:

Electronic devices of this type have the advantage that unevennesses of the surface 3 of the substrate 4 can be compensated over the length of the contact pins 16, by virtue of the fact that the contact pin 16 can match the unevennesses by bending under plastic and elastic [ [lacuna] ] forces. This is particularly advantageous if the contact pin 16 is intended to serve for testing the function of an electronic device on a wafer before the wafer is separated into individual electronic devices or semiconductor chips having an integrated circuit by means of a separation technique. To that end, a test head having contact connection areas which are held by an intermediate carrier and are arranged spatially opposite the contact areas may be pressed onto the contact heads 8 of the contact pins 16, the contact pressure compensating the unevennesses of the substrate 4 and of the intermediate carrier and hence the different distances between the two.

Page 31, line 22 through page 32, line 2, Furthermore, the lateral movement of the obliquely arranged contact pin 16 of figure 2 which is triggered when pressure is exerted is also particularly advantageous[,]. [said] The movement [contributing] contributes to reliable contact-making as a result of the contact point rubbing freely on an opposite

contact connection area (not shown) of an intermediate carrier.

Page 33, lines 1-9:

In figure 3, a patterned metal layer with passivation layer 15 and uncovered contact areas 1 is applied on the surface 3 of a substrate 4. This patterning of the metal layer and the uncovering of the contact areas 1 may preferably be effected by means of photoresist technology of a closed conductive layer or of a closed passivation layer 15 made of  $\text{Si}_3\text{N}_4$ . As is shown by figure 4, a closed conductive layer 10 is applied to this passivation layer 15 with uncovered contact areas 1[, said]. The layer 10 [short-circuiting] short circuits all the contact areas 1.

Page 34, lines 1-11:

As shown by figure 7, the through openings 12 are filled with metal by means of electrodeposition, thereby producing a three-dimensionally extending microscopically small contact element 5 which is connected to the contact area 1 in one piece and integrally. In the embodiment as shown by figure 7, the closed conductive layer 10 is made of a copper alloy and an electrodeposited contact [pin 30] pin 16 has a [with its] contact head 8 that is made of an adapted copper alloy[, the]. The contact head 8, after being formed, [being] is

refined by coating with [a] nickel and a gold coating, which [is] are likewise electrodeposited.

Page 35, lines 13-24:

A solder coating [of] placed on the contact heads 8 is preferably used for enabling the contact heads 8 [with] to contact connection areas of an intermediate carrier[, ] which carries the rewiring[, ] to external electrical connections that are distributed on an area. The electrical connections are usually contact bumps which are formed from solder balls and project in rows and/or columns on one side of the housing, while the housing carries the semiconductor chip on the other side. The connection of the intermediate carrier with rewiring to the contact heads 8 can also be carried out for a multiplicity of contact heads 8 on a wafer and the separation of this assembly into electronic devices can then take place.

Page 38, top [Patent Claims] We Claim:

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Page 51, top, [Abstract] Abstract of the Disclosure:

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Page 51, lines 4-5, [electronic device having microscopically small contact areas and methods for producing it].

Page 51, lines 6-14, [The invention relates to an electronic device and methods for producing it, the device having at least one microscopically small contact area (1) for an electronic circuit having interconnects (2) on a surface (3) of a substrate (4), and furthermore the contact area (1) additionally comprising a three-dimensionally extending microscopically small contact element (5) which is connected to the contact area (1) in one piece and integrally.]

An electronic device and a method for producing the electronic device which has at least one microscopically small contact area for an electronic circuit having interconnects that are on a surface of a substrate. A three-dimensionally extending microscopically small contact element is integrally one-piece connected to the contact area.

Page 51, line 16, [ [Figure 1] ].